

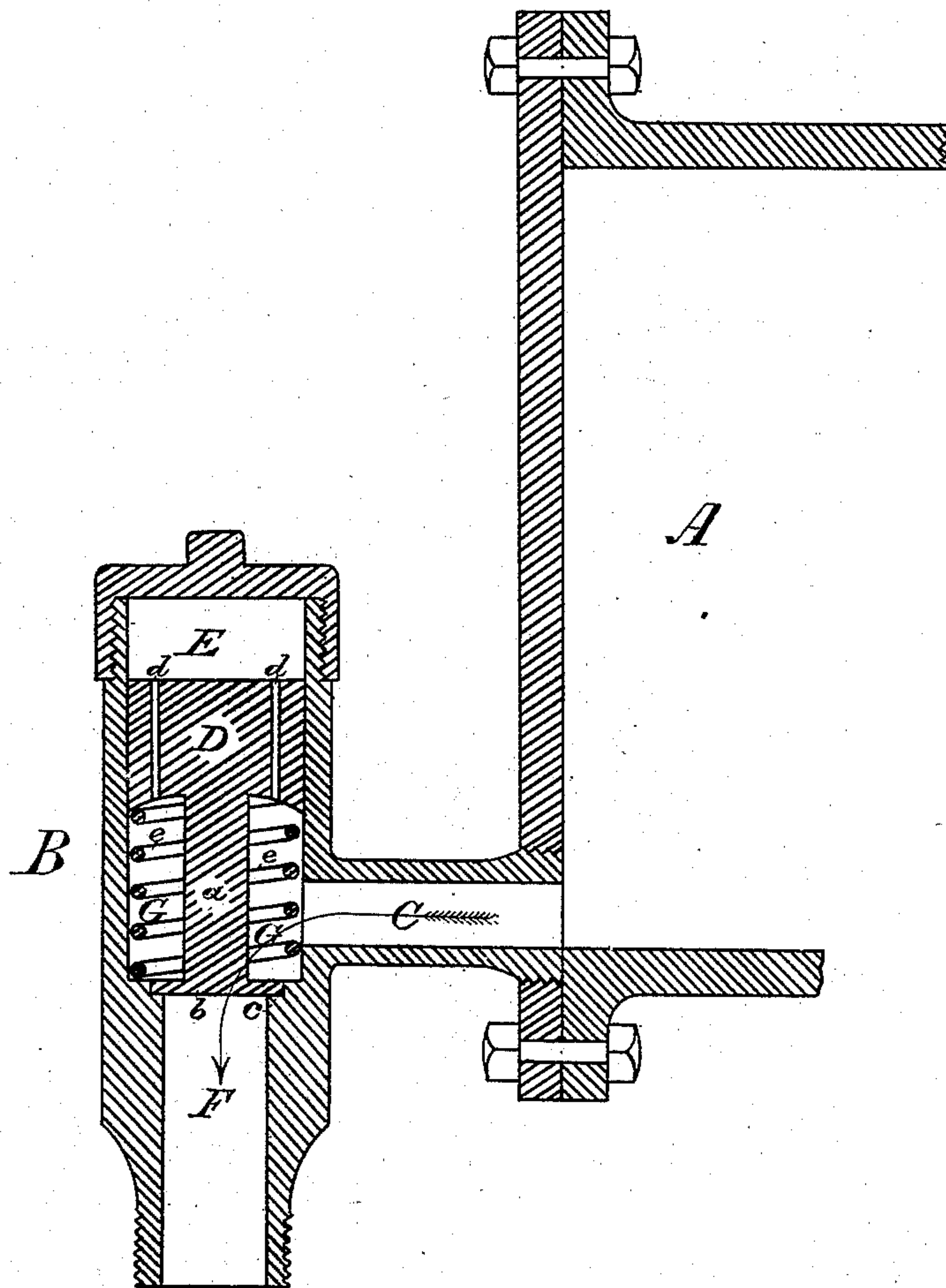
(No Model.)

E. RICHARDS & A. KRIEGER.

STEAM CYLINDER COCK.

No. 270,250.

Patented Jan. 9, 1883.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ELIAS RICHARDS AND ANDREW KRIEGER, OF SALAMANCA, NEW YORK.

## STEAM-CYLINDER COCK.

SPECIFICATION forming part of Letters Patent No. 270,250, dated January 9, 1883.

Application filed August 25, 1882. (No model.)

*To all whom it may concern:*

Be it known that we, ELIAS RICHARDS and ANDREW KRIEGER, both of Salamanca, in the county of Cattaraugus and State of New York, have invented a new and useful Improvement in Steam-Cylinder Cocks, which is fully set forth in the following specification, reference being had to the accompanying drawing.

10 The object of our invention is to insure safety against the blowing off of the heads of steam-engine cylinders, which is now a frequent occurrence. Such explosions are known to be the result of the formation of too much water 15 in the steam-cylinder, caused by the condensing of steam, without the necessary avenue of escape therefrom. These cocks as at present in use permit also the escape of steam when opened to let the water escape, and, further- 20 more, entail great difficulty in their operation when connected with a rapid-moving locomotive-engine; and to overcome these obstacles we have invented and perfected an automatic steam-cylinder cock which allows at all times 25 a free escape of water.

The drawing represents a vertical longitudinal section of that part of the cylinder known as "head," to which our invention is attached, and also a longitudinal vertical section of the 30 cock when closed; and the letters thereon represent the various parts thereof, as hereinafter fully described and set forth.

A is the cylinder-head, provided with our improved cock.

35 B is a cylindrical vertical cock provided with a connecting-tube, C, the end of which is inserted into the cylinder-head in the usual manner.

D is the valve, made to closely fit the cock, 40 and is provided with a pendent cylindrical base, *a*, the lower extremity of which is provided with a concentric flange, *b*, resting on the valve-seat *c*. The upper portion of the valve D is provided with an annular dished or 45 concave lower surface, as shown. This annular dished surface is in area greater than the concentric flange *b*.

*d d* are two apertures formed by vertically

perforating the valve, as shown. These apertures form a vent or air-connection between 50 the capped chamber E and the annular chamber G, and are very small in diameter, so that while they readily form an outlet for the dry steam they will exclude wet steam from readily entering through them into the capped cham- 55 ber E.

F is the escape-pipe.

*e* is a spiral spring, concentrically encircling the pendent cylindrical base *a*, and forms, to some extent, a counter-balance for the weight 60 of the valve, so that it may be raised with but slight pressure.

In its operation, the steam generated in the cylinder escapes through the passage C into the annular chamber G. Now, it is a well-es- 65 tablished fact that partly-condensed or wet steam, on account of its specific gravity, settles to the bottom of the cylinder, while the dry steam seeks the highest point. The steam, therefore, that enters mostly through the pas- 70 sage C, which is on line with the bottom of the cylinder, must necessarily be that which is partly condensed, and exerts an equal pressure on all sides of the annular chamber G; but the area of the concave lower surface of valve D 75 being greater than that of the concentric flange *b* the valve is raised off its seat, and allows the water to escape through escape-pipe F. The water that thus escapes is immediately re- 80 placed by dry steam, which enters in the same manner into the chamber G, but escapes upward through the apertures *d d* into chamber E, producing a counter-pressure, by that means leaving the valve intact on its seat.

What we claim as our invention, and desire 85 to secure by Letters Patent, is—

In combination with the steam-cylinder A, the cock B, provided with valve D, connecting-tube C, chamber E, annular steam-chamber G, spiral spring *e*, and escape F, substantially as 90 and for the purpose specified.

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